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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/075,021	02/12/2002	James J. Finley	1074D2	8098

7590 07/13/2005

P P G INDUSTRIES, INC.
ONE P P G PLACE
39TH FLOOR
PITTSBURGH, PA 15272

EXAMINER

PIZIALI, ANDREW T

ART UNIT	PAPER NUMBER
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1771

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/075,021

Applicant(s)

FINLEY ET AL.

Examiner

Andrew T. Piziali

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 2/12/2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. The amendment filed on 5/27/2005 has been entered. The examiner has withdrawn the 35 USC 112 rejections based on the amendments to the claims.

Declarations

2. The declarations filed on 4/21/2005 (stamped on 4/25/2005) are defective. MPEP 715.04 states that for a declaration filed under 37 CFR 1.131 to be considered, all inventors of the claimed subject matter must sign the declaration. All inventors did not sign the declarations submitted on 4/21/2005.

Claim Rejections - 35 USC § 102/103

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 21-52 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over USPN 5,589,280 to Gibbons et al. (hereinafter referred to as Gibbons).

Regarding claims 21-52, Gibbons discloses a coated product comprising a substrate and a film sputtered from a metal cathode target, such as titanium, in an atmosphere comprising inert gas and reactive gas such that the metal target is sputtered in a metallic mode to deposit a metal film wherein a metal oxide film is deposited over the metal film (see entire document including column 2, line 6 through column 3, line 10 and lines 38-45, column 5, lines 24-28, column 5, line 63 through column 7, line 35, and column 7, line 64 through column 8, line 14).

Gibbons does not specifically mention whether the film is amorphous, but the current specification discloses that titanium is deposited in a substantially amorphous metallic state by sputtering the metal in a nonreactive atmosphere substantially comprising inert gas, but also comprising a small amount of reactive gas, such as oxygen (see page 3, lines 7-19). Considering that Gibbons discloses that the metal film may be deposited in the "metal mode" (column 7, lines 20-35), and considering that Gibbons discloses that the "metal mode" is known in the art and that the technique comprises sputtering in an inert atmosphere with a limited amount of oxygen so as to control the degree of oxidation such that the film is present as a metal rather than a metal oxide (column 7, lines 20-35), it appears that the titanium metal film inherently possesses an amorphous structure.

Due to the identical method of producing the metal film taught by Gibbons, compared to the claimed method, it is the examiner's position that the article of the applied prior art is identical to or only slightly different than the claimed article. Even though product-by-process

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claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). The burden has been shifted to the applicant to show obvious difference between the claimed product and the prior art product. *In re Marosi*, 218 USPQ 289 (Fed. Cir. 1983). The applied prior art either anticipated or strongly suggested the claimed subject matter. It is noted that if the applicant intends to rely on Examples in the specification or in a submitted declaration to show non-obviousness, the applicant should clearly state how the Examples of the present invention are commensurate in scope with the claims and how the Comparative Examples are commensurate in scope with the applied prior art.

Regarding claims 22-24, 32 and 40-44, Gibbons discloses that the metal may be titanium (column 6, lines 1-9).

Regarding claims 25-26 and 46, Gibbons discloses that the metal film may be deposited in the range of 3 to 200 Å (column 2, lines 39-60).

Regarding claims 27-29, 31-34 and 43, Gibbons discloses that the reactive gas may be oxygen (column 7, lines 20-35).

Regarding claims 29-34 and 43, Gibbons discloses that the inert gas may be argon (column 9, lines 9-16).

Regarding claims 32, 35, 40 and 43, Gibbons discloses that the substrate may be glass (column 5, lines 24-28).

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Regarding claims 33-34, Gibbons does not mention any percent oxygen, but as explained above, it is the examiner's position that the article of the applied prior art is identical to or only slightly different than the claimed article. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. In addition, Gibbons discloses that the "metal mode" is known in the art and that the amount of oxygen is varied based on the degree of oxidation desired (column 7, lines 20-35). It would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the amount of oxygen present, such as between 2 to 15 percent, because it is within the general skill of a worker in the art to select an amount of oxidation on the basis of its suitability.

Regarding claims 36-43, 48, 49 and 51, Gibbons discloses that the coated product may be thermally oxidized before or after depositing the metal oxide film (column 7, lines 36-44).

Regarding claim 37, Gibbons does not mention any thermal oxidation temperature, but Gibbons clearly discloses that the coated product may be heat treated in an oxygen atmosphere to produce thermal oxidation (column 7, lines 36-44). It is the examiner's position that the article of the applied prior art is identical to or only slightly different than the claimed article. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself.

Regarding claims 36-37, 45 and 51, Gibbons discloses that the metal oxide film may be reactively sputtered (column 8, lines 2-14).

Regarding claim 40, Gibbons does not mention the density or refractive index of the metal oxide film, but considering the substantially identical sputtering method of depositing the

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metal oxide film, compared to the method taught by the current specification, it appears that the metal oxide film of Gibbons inherently possesses the claimed properties.

Regarding claims 40-44, Gibbons discloses that the metal of the metal oxide films may be titanium (column 8, lines 2-14).

Regarding claims 39 and 46, Gibbons discloses that the metal oxide film may have a thickness of less than 10,000 Å, with 20 to 250 Å being typical (column 8, lines 2-14).

Regarding claims 47, 49 and 52, Gibbons does not mention the hardness or density of the metal film (before or after a thermally oxidizing heat treatment), but considering the substantially identical sputtering method of depositing the metal oxide film in an atmosphere comprising inert gas and reactive gas, compared to the method taught by the current specification, it appears that the metal oxide film of Gibbons inherently possesses the claimed properties.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,589,280 to Gibbons as applied to claims 21-52 above, and further in view of USPN 4,188,452 to Groth.

Gibbons discloses that the coated product may be heat treated in an oxygen atmosphere to produce thermal oxidation (column 7, lines 36-44), but Gibbons does not mention a thermal oxidation temperature range. Gibbons is silent with regards to a specific thermal oxidation temperature range, therefore, it would have been obvious to look to the prior art for conventional

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thermal oxidation temperature ranges. Groth provides this conventional teaching showing that it is known in the art to thermally oxidize titanium oxide films at a temperature of from 400C to 500C (see entire document including column 2, lines 9-18). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to thermally oxidize at a temperature between 400C and 500C, as taught by Groth, motivated by the expectation of successfully practicing the invention of Gibbons.

8. Claims 21-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,589,280 to Gibbons in view of USPN 4,522,844 to Khanna et al (hereinafter referred to as Khanna).

Regarding claims 21-52, Gibbons discloses a coated product comprising a substrate and a film sputtered from a metal cathode target in an atmosphere comprising inert gas and reactive gas such that the metal target is sputtered in a metallic mode to deposit a metal film wherein a metal oxide film is deposited over the metal film (see entire document including column 2, line 6 through column 3, line 10 and lines 38-45, column 5, lines 24-28, column 5, line 63 through column 7, line 35, and column 7, line 64 through column 8, line 14).

Gibbons does not specifically mention whether the film is amorphous, but the current specification discloses that titanium is deposited in a substantially amorphous metallic state by sputtering the metal in a nonreactive atmosphere substantially comprising inert gas, but also comprising a small amount of reactive gas, such as oxygen (see page 3, lines 7-19). Considering that Gibbons discloses that the metal film may be deposited in the "metal mode" (column 7, lines 20-35), and considering that Gibbons discloses that the "metal mode" is known in the art and that the technique comprises sputtering in an inert atmosphere with a limited amount of oxygen so as

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to control the degree of oxidation such that the film is present as a metal rather than a metal oxide (column 7, lines 20-35), it appears that the titanium metal film inherently possesses an amorphous structure.

In the event that it is shown that the titanium metal film is not inherently amorphous, Khanna discloses that it is known in the glass and plastic coated substrate art to sputter from a metal target in an atmosphere comprising inert gas and reactive gas to result in a metal film having an amorphous structure with a smooth surface and high corrosion resistance (see entire document including column 1, lines 28-68, column 2, lines 33-44, column 3, lines 31-33). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the metal film amorphous, as taught by Khanna, motivated by the expectation of creating a smooth metal film with high corrosion resistance.

Due to the identical method of producing the metal film taught by the prior art, compared to the claimed method, it is the examiner's position that the article of the applied prior art is identical to or only slightly different than the claimed article. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself.

Regarding claims 22-24, 32 and 40-44, Gibbons discloses that the metal may be titanium (column 6, lines 1-9).

Regarding claims 25-26 and 46, Gibbons discloses that the metal film may be deposited in the range of 3 to 200 Å (column 2, lines 39-60).

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Regarding claims 29-34 and 43, Gibbons discloses that the inert gas may be argon (column 9, lines 9-16).

Regarding claims 32, 35, 40 and 43, Gibbons discloses that the substrate may be glass (column 5, lines 24-28).

Regarding claims 33-34, Gibbons does not mention any percent oxygen, but as explained above, it is the examiner's position that the article of the applied prior art is identical to or only slightly different than the claimed article. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. In addition, Gibbons discloses that the "metal mode" is known in the art and that the amount of oxygen is varied based on the degree of oxidation desired (column 7, lines 20-35). It would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the amount of oxygen present, such as between 2 to 15 percent, because it is within the general skill of a worker in the art to select an amount of oxidation on the basis of its suitability.

Regarding claims 36-43, 48, 49 and 51, Gibbons discloses that the coated product may be thermally oxidized before or after depositing the metal oxide film (column 7, lines 36-44).

Regarding claim 37, Gibbons does not mention any thermal oxidation temperature, but Gibbons clearly discloses that the coated product may be heat treated in an oxygen atmosphere to produce thermal oxidation (column 7, lines 36-44). It is the examiner's position that the article of the applied prior art is identical to or only slightly different than the claimed article. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself.

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Regarding claims 36-37, 45 and 51, Gibbons discloses that the metal oxide film may be reactively sputtered (column 8, lines 2-14).

Regarding claim 40, Gibbons does not mention the density or refractive index of the metal oxide film, but considering the substantially identical sputtering method of depositing the metal oxide film, compared to the method taught by the current specification, it appears that the metal oxide film of Gibbons inherently possesses the claimed properties.

Regarding claims 40-44, Gibbons discloses that the metal of the metal oxide films may be titanium (column 8, lines 2-14).

Regarding claims 39 and 46, Gibbons discloses that the metal oxide film may have a thickness of less than 10,000 Å, with 20 to 250 Å being typical (column 8, lines 2-14).

Regarding claims 47, 49 and 52, Gibbons does not mention the hardness or density of the metal film (before or after a thermally oxidizing heat treatment), but considering the substantially identical sputtering method of depositing the metal oxide film in an atmosphere comprising inert gas and reactive gas, compared to the method taught by the current specification, it appears that the metal oxide film of Gibbons inherently possesses the claimed properties.

9. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,589,280 to Gibbons in view of USPN 4,522,844 to Khanna as applied to claims 21-52 above, and further in view of USPN 4,188,452 to Groth.

Gibbons discloses that the coated product may be heat treated in an oxygen atmosphere to produce thermal oxidation (column 7, lines 36-44), but Gibbons does not mention a thermal oxidation temperature range. Gibbons is silent with regards to a specific thermal oxidation temperature range, therefore, it would have been obvious to look to the prior art for conventional

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Response to Arguments

10. Applicant's arguments filed 5/27/2005 have been fully considered but they are not persuasive.

The applicant asserts that the metal film disclosed by Gibbons is not amorphous. The examiner respectfully disagrees. Gibbons discloses a coated product comprising a substrate and a film sputtered from a metal cathode target, such as titanium, in an atmosphere comprising inert gas and reactive gas such that the metal target is sputtered in a metallic mode to deposit a metal film wherein a metal oxide film is deposited over the metal film (see entire document including column 2, line 6 through column 3, line 10 and lines 38-45, column 5, lines 24-28, column 5, line 63 through column 7, line 35, and column 7, line 64 through column 8, line 14).

Gibbons does not specifically mention whether the film is amorphous, but the current specification discloses that titanium is deposited in a substantially amorphous metallic state by sputtering the metal in a nonreactive atmosphere substantially comprising inert gas, but also comprising a small amount of reactive gas, such as oxygen (see page 3, lines 7-19). Considering that Gibbons discloses that the metal film may be deposited in the "metal mode" (column 7, lines 20-35), and considering that Gibbons discloses that the "metal mode" is known in the art and that

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the technique comprises sputtering in an inert atmosphere with a limited amount of oxygen so as to control the degree of oxidation such that the film is present as a metal rather than a metal oxide (column 7, lines 20-35), it appears that the titanium metal film inherently possesses an amorphous structure. The applicant has failed to show, or attempt to show, that the metal film is not amorphous.

The applicant asserts that the declarations filed on 4/21/2005 (stamped on 4/25/2005) overcome the Gibbons rejections. The examiner respectfully disagrees. MPEP 715.04 states that for a declaration filed under 37 CFR 1.131 to be considered, all inventors of the claimed subject matter must sign the declaration. All inventors did not sign the declarations submitted on 4/21/2005.

Conclusion

11. The following patents are cited to further show the state of the art with respect to metal films sputtered in an atmosphere comprising inert gas and reactive gas:

USPN 4,132,919 to Maple

USPN 3,711,734 to Yamazaki et al.

USPN 3,560,784 to Steele et al.

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Piziali whose telephone number is (571) 272-1541. The examiner can normally be reached on Monday-Friday (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

571 7/15/05
ANDREW T. PIZIALI
PATENT EXAMINER

atp


TERREL MORRIS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700